MISCELLANEA ZOOLOGICA HUNGARICA
Tomus 12. 1998 p. 55–60

# New Hungarian mayfly (Ephemeroptera) species arising from collectings of larvae

by
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(Received June 5, 1998)

**Abstract:** This publication presents 12 new Ephemeroptera species for the Hungarian fauna (*Baetis gracilis*, *Baetis niger*, *Baetis scambus*, *Baetis vardarensis*, *Pseudocentroptilum nanum*, *Pseudocentroptilum pulchrum*, *Rhitrogena beskidensis*, *Electrogena fascioculata*, *Ephemerella mucronata*, *Ephemerella mesoleuca*, *Neoephemera maxima*, *Brachycercus minutus*). From these *N. maxima* represents a new family: Neoephemeridae.
**Keywords:** Hungary, Ephemeroptera larva, faunistics, distribution, communities, habitat

## Introduction

In the Hungarian literature on Ephemeroptera only a few papers deal with larvae, furthermore, these works deal with a smaller area, or concentrate on a single water body or a single genus (Erdelics 1968, Ujhelyi 1966, 1979, Andrikovics, 1988a, b, 1991).

The authors collected 466 times at 346 localities from 08. 04. 1994 till 14. 05. 1998. The sampling sites include all the large regions of Hungary and represent all the important water types (bog, marsh, dead-arm, lake, stream, river, canal etc.) of plains, hills, and mountains. The same areas were continuously sampled for several years (Szigetköz, Őrség, Kis-Balaton, Upper Tisza, Mátra).

From the collected material the elaboration of some taxa – Baetidae, Rhitrogena, Ecdyonurus, Electrogena – is still in progress. This paper is the first part of a series in which the already existing and the new results will be continuously published.

## Methods and material

The specimens were collected with the help of a net from the bottom material, from the surface of the bottom, from submerged aquatic plants, from roots, accumulated floating debris, from parts of plants hanging down into the water. From stones, logs, branches and other objects lifted up from under the water Ephemeroptera specimens were singled. The collected material was preserved in 70 % ethanol and is deposited in the Mátra Museum at Gyöngyös.

## Results

In the list of species the name is followed by the collecting site, the UTM map codes of the localities, date of collection, number of specimens caught and the name of collectors. We also describe the distribution of the species, the habitat where it was found, and the rare Ephemeroptera species collected at the same site. Together with the new species those

Ephemeroptera species were regarded rare that were found at only 10 or less localities from the 346 sampling sites (Cloeon dipterum was collected at 120 localities)

**Family Baetidae**

*Baetis gracilis* Bogoescu & Tabacaru, 1957
Tiszabecs: Mázsáló, Tisza FU33 01. 08. 1995, 1, T. Kovács, G. Szilágyi.
This species occurs in the Alps, Carpathians, Caucasus, and the foothills of Pamir Mountains.
A single specimen was collected at a locality characterised by strong water current, from the rough gravelly bottom.
Rare Ephemeroptera species found together with this species: *Baetis vardarensis*, *Oligoneuriella rhenana*, *Rhithrogena beskidensis*, *Heptagenia coerulans*, *Torleya major*.

*Baetis niger* (Linnaeus, 1761)
Kercaszomor: Kerca XM08 08.04.1998, 3, A. Ambrus, P. Juhász, T. Kovács, P. Sevola, I. Turcsányi – Lenti: Road number 75, Kerka XM16 08.04.1998, 1, A. Ambrus, P. Juhász, T. Kovács, P. Sevola, I. Turcsányi.
Occurs throughout Europe to the Ural Mountains and in Asia Minor
Both of the two specimens were collected from the slowly-flowing edge of water bodies with gravelly bottom skirted with aquatic plants.
Rare Ephemeroptera species found together with this species: *Leptophlebia marginata*, *Habrophlebia lauta*.

*Baetis scambus* Eaton, 1870
Bódvalenke: road to Komjáti, Bódva DU87 29.05.1997, 1, T. Kovács – Bódvarákó: Ostromosalja, Bódva DU87 29.05.1997, 3, T. Kovács – Tiszabecs: Mázsáló, Tisza FU33 08. 06. 1995., 2, K. Bánkuti, T. Kovács senior, T. Kovács.
A species of European distribution.
At all the three localities the specimens were collected from the rough gravelly bottom of swift-flowing water bodies.
Rare Ephemeroptera species found together with this species: *Baetis vardarensis*, *Torleya major*.

*Baetis vardarensis* Ikonomov, 1962
Csákánydoroszló: road to Iványc, Rába XN10 17.05.1997, 1, A. Ambrus – Kéked: Topolya-szeg, Hernád EU27 23.08.1997, 8, T. Kovács, V. G. Papp, G. Szilágyi – Mosonmagyaróvár: Lajta XP60 08.05.1997, 7, A. Ambrus, K. Bánkuti, T. Kovács – Tiszabecs: Mázsáló, Tisza FU33 08.06.1995, 1, K. Bánkuti, senior T. Kovács, T. Kovács; 01. 08. 1995, 1, T. Kovács, G. Szilágyi.
Except for the northern parts the species occurs throughout Europe.
Similarly to the former species these specimens were also collected from the gravelly bottom of fast running sections of rivers.
Rare Ephemeroptera species found together with this species: *Baetis gracilis*, *Baetis scambus*, *Oligoneuriella rhenana*, *Rhithrogena beskidensis*, *Heptagenia coerulans*, *Ephemera lineata*, *Ephemerella notata*, *Torleya major*.

*Pseudocentroptilum nanum* (Bogoescu, 1951)
Tótújfalu: Dráva YL08 17.19.1997, 1, K. Bánkuti, T. Kovács, A. Varga.
A species of Central-East Europe.
The single specimen was collected from a slow flowing section of the Dráva from the muddy bottom near the edge of the water.

*Pseudocentroptilum pulchrum* (Eaton, 1885)
Körmend: road number 86, Rába XN20 09.10.1997, 1, A. Ambrus – Szatmárcseke: Túrbukó, Tisza FU22 27.09.1995, 5, K. Bánkuti, P. Juhász, T. Kovács – Tarpa: 710 river kilometre, Tisza FU12 06.06.1996, 1, T. Kovács – Tiszabecs: Batár outlet, Tisza FU32 30.07.1995., 3, T. Kovács, G. Szilágyi; Mázsáló, Tisza FU33 03.08.1995, 1, P. Juhász, T. Kovács; 28.09.1995, 2, K. Bán-

kuti, T. Kovács; 06.06.1996, 1, P. Juhász, T. Kovács.
Occurs throughout Europe to the Ural Mountains.
This species was usually collected at the slowly-flowing sections of rivers with muddy bottom or from the organic debris, but seldom was also found on sections of stronger current.
Rare Ephemeroptera species found together with this species: *Raptobaetopus tenellus*, *Procloeon bifidum*, *Isonychia ignota*, *Oligoneuriella rhenana*, *Electrogena fascioculata*, *Heptagenia coerulans*, *Choroterpes picteti*, *Ephoron virgo*, *Ephemera lineata*, *Palingenia longicauda*, *Torleya major*.

**Family Heptageniidae**

*Rhithrogena beskidensis* Alba-Tercedor & Sowa, 1987
Kőszeg: Hámor, Gyöngyös XN15 31. 07. 1997, 3, A. Ambrus – Magyarlak: lido, Rába XN00 19.06.1997, 4, A. Ambrus, K. Bánkuti, T. Kovács – Tiszabecs: Mázsáló, Tisza FU33 01.08.1995, 1, T. Kovács, G. Szilágyi.
Specimens were collected on the rough gravelly bottom of swift-flowing river sections.
Rare Ephemeroptera species found together with this species: *Baetis gracilis*, *Baetis vardarensis*, *Oligoneuriella rhenana*, *Electrogena fascioculata*, *Heptagenia coerulans*, *Ephoron virgo*, *Ephemerella mesoleuca*, *Torleya major*.

*Electrogena fascioculata* (Sowa, 1974)
Körmend: Road number 86, Rába XN20 19.06.1997, 4, A. Ambrus, K. Bánkuti, T. Kovács – Kőszeg: Hámor, Gyöngyös XN15 31.07.1997, 1, A. Ambrus – Tiszabecs: Batár outlet, Tisza FU32 30.07.1995, 1, T. Kovács, G. Szilágyi; Szabó-füzes, borderstone number 109, Tisza FU33 03.08.1995, 1, P. Juhász, T. Kovács.
The specimens of the species were collected in the same rivers and water-types as the previous species.
Rare Ephemeroptera species found together with this species: *Raptobaetopus tenellus*, *Pseudocentroptilum pulchrum*, *Procloeon bifidum*, *Isonychia ignota*, *Oligoneuriella pallida*, *Rhithrogena beskidensis*, *Heptagenia coerulans*, *Ephoron virgo*, *Ephemera lineata*, *Ephemerella mesoleuca*.

**Family Ephemerellidae**

*Ephemerella mesoleuca* (Brauer, 1857)
Körmend: Road number 86, Rába XN20 19.06.1997, 3, A. Ambrus, K. Bánkuti, T. Kovács – Magyarlak: lido, Rába XN00 19.06.1997, 2, A. Ambrus, K. Bánkuti, T. Kovács.
The species occurs in the central, southern and eastern parts of Europe.
At both localities low number of individuals were collected, from organic floating material and plants hanging down into the water.
Rare Ephemeroptera species found together with this species: *Isonychia ignota*, *Oligoneuriella rhenana*, *Rhithrogena beskidensis*, *Electrogena fascioculata*, *Heptagenia coerulans*, *Ephoron virgo*.

*Ephemerella mucronata* (Bengtsson, 1909)
Kőszeg: Kálvária Hill, Gyöngyös XN15 13.05.1998, 6, A. Ambrus, K. Bánkuti, T. Kovács – Mosonmagyaróvár: Lajta XP60 10.05.1995, 6, A. Ambrus, K. Bánkuti, T. Kovács.
A species of Holarctic distribution.
The larvae of this species were collected during a flood period from the River Lajta. In the course of following samplings (on 8 occassions) this species was not found at that locality. The locality at Kőszeg both in its appearance and species composition is similar to the areas of Burgenland where this species was collected (Kobersdorf: Schwarzenbach; Marz: Marzerbach; Stoob: Stooberbach; Steinberg-Dörfl: Rabnitz; Langeck: Zöbernbach; Liebing: Güns).
Rare Ephemeroptera species found together with this species: *Ephemerella notata*, *Torleya major*.

### Family Neoephemeridae

*Neoephemera maxima* (Joly, 1870)
Sárvár: road number 84, Rába, 155 m XN43 07.05.1997, 8 females (2 mature), 1 mature male, A. Ambrus, K. Bánkuti, T. Kovács; 12.05.1998, 11 females (5 mature), 3 mature males, A. Ambrus, K. Bánkuti, T. Kovács. (The size of larvae without caudal filament and cerci: females 10,5-13,5 mm, average: 11,4 mm; males 9-10 mm, average 9,5 mm.)
This species occurs in the Western European and Eastern European Plains and the eastern part of the Balkan Peninsula and in the Baltic countries.
At both of the two collectings the species was caught in high numbers, and hence its population can be regarded stable. Most often the specimens were collected from branches, logs, and other floating debris, and only a few individuals were found on the algae-covered larger stones.
The sampling site includes very diverse water habitats, as shown by the list of species collected here. From the sampled sections of Rába located upstream (Szakonyfalu, Magyarlak, Csákánydoroszló, Körmend) and downstream (Várkesző, Győr) of Sárvár we did not find this species.
Among the water invertebrates collected with this species several are very rare or characteristic rheophilous species, preferring clear water.

Hirudinea: *Glossiphonia complanata*, *Caspiopdella fadejewi*, *Cystobranchus respirans*, *Erpobdella octoculata*, *Trocheta cylindrica*; Mollusca: *Theodoxus transversalis*, *Ancylus fluviatilis*, *Unio pictorum*, *Unio tumidus*, *Unio crassus*, *Anodonta cygnea*, *Sphaerium corneum*; Ephemeroptera: *Siphlonurus lacustris*, *Ametropus fragilis*, *Baetis fuscatus*, *Baetis rhodani*, *Centroptilum luteolum*, *Heptagenia flava*, *Heptagenia longicauda*, *Heptagenia sulphurea*, *Paraleptophlebia submarginata*, *Habrophlebia fusca*, *Habrophlebia lauta*, *Potamanthus luteus*, *Ephemerella ignita*, *Ephemerella notata*; Odonata: *Calopteryx splendens*, *Platycnemis pennipes*, *Stylurus flavipes*, *Gomphus vulgatissimus*, *Ophiogomphus cecilia*, *Onychogomphus forcipatus*; *Heteroptera*: *Aphelocheirus aestivalis*; Coleoptera: *Macronychus quadrituberculatus*.

### Family Caenidae

*Brachycercus minutus* Tshernova, 1952
Drávaszabolcs: road number 58, Dráva BR87 17.09.1997, 4, K. Bánkuti, T. Kovács, A. Varga – Tivadar: lido, Tisza FU12 04.10.1995, 1, I. Turcsányi.
A species of Palearctic distribution. The specimens were collected from the bottom or the organic sediment accumulated there.

## Discussion

The occurrence of the 12 species discussed in this paper was expected on the basis of their distribution. An exception is *Neoephemera maxima*.

The map (Fig. 2.) illustrates those areas – water bodies – where the new species were found. Highest number of new species was recorded on the Upper Tisza (7 species): *Baetis gracilis*, *Baetis scambus*, *Baetis vardarensis*, *Pseudocentroptilum pulchrum*, *Rhithrogena beskidensis*, *Electrogena fascioculata*, *Brachycercus minutus*; this is followed by the River Rába (6 species): *Baetis vardarensis*, *Pseudocentroptilum pulchrum*, *Rhithrogena beskidensis*, *Electrogena fascioculata*, *Ephemerella mesoleuca*, *Neoephemera maxima*; then River Gyöngyös (3 species): *Rhithrogena beskidensis*, *Electrogena fascioculata*, *Ephemerella mucronata*; the Dráva (2 species): *Pseudocentroptilum nanum*, *Brachycercus minutus*; the

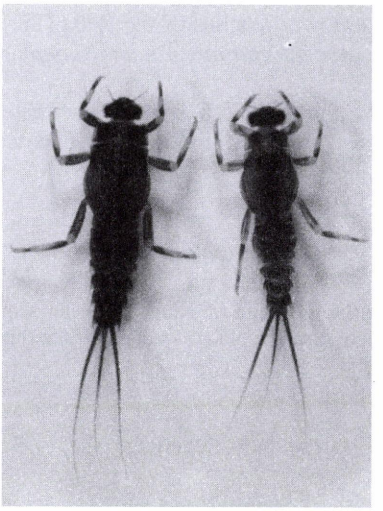

Fig. 1. Female and male larvae of *Neoephemera maxima*, body length without caudal filament and cerci 11 mm and 10 mm, respectively. Foto: Gy. Csóka

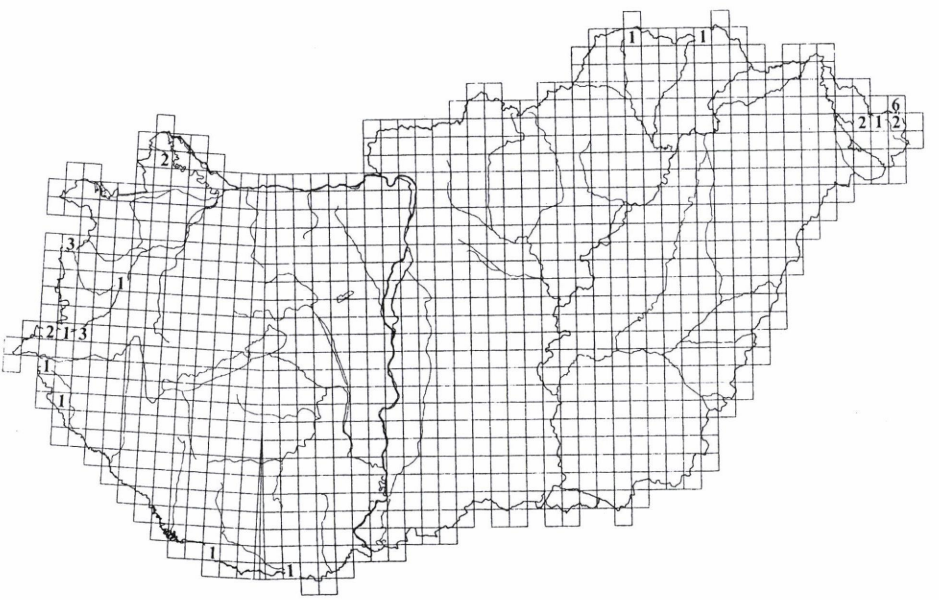


Fig. 2. UTM map of Hungary showing the number of collected new Ephemeroptera species in the 10 by 10 km quadrates

Lajta (2 species): *Baetis vardarensis*, *Ephemerella mucronata*; the Bódva: *Baetis scambus*; the Hernád *Baetis vardarensis*; the Kerca: *Baetis niger*; and at last the Kerka: *Baetis niger*.

On the Upper reaches of the Tisza the influence of the Carpathians, on the Rába and Gyöngyös rivers the proximity of the Alps account for the high number of rheophilous

species. On the Dráva and the lower reaches of the Rába (Sárvár) we collected the species characteristic of plains (*Pseudocentroptilum nanum*, *Neoephemera maxima*, *Brachycercus minutus*).

Sziráki (1995) listed 72 Ephemeroptera species occurring in Hungary, that number increases to 84 with the species published in our paper. The occurrence of further species is still expected.

## Acknowledgements

We are grateful to Adam Glazaczow, Nikita Ju. Kluge and Peter Malzacher for their help in the elaboration of the material. I. Turcsányi must be acknowledged for the data of *Brachycercus minutus* from the Tisza.

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